REMARKS

Rejection - 35 U.S.C. 102(b)

The Examiner has rejected claims 1-4, 13, 14, 16, 21, 57, and 69 under 35 U.S.C. 102(e) as being anticipated by Takahashi (US. Pat. No. 6,300,814). In reply, Applicant emphasizes that a claim is anticipated if, and only if, each and every element in the claim is found, either expressly or inherently, in the prior art reference(s); and will show that no anticipation exists here for the following reasons.

The examiner proposed that Takahashi teaches the all of the substantial features of the claimed invention. Applicant emphasizes that the present invention is an active electronic isolator, which serves to isolate the source stage from noise. Applicant respectfully set forth the following remarks.

Claim 1

With respect to the claim 1, Takahashi fails to teach, describe, or suggest the following features:

1. *"an active electronic isolator"*

Takahashi discloses an attenuator, not an isolator (abstract of Takahashi). This difference between these types of devices has been discussed in previous responses, particularly the response to the second rejection, wherein it was alleged Chan et al. (US 6,191,665 B1) anticipated the present claims.

As a simple reminder, the pedigree and characteristics of an isolator are illustrated by the following definition of an isolator (ferrite) taken from "Modern Dictionary of Electronics" published in 1963:

"A microwave device which allows RF energy to pass through in one direction with very little loss, but absorbs RF power in the other direction."

From same reference, an attenuator is defined as:

"A distributed network that absorbs part of a signal and transmits the remainder with a minimum of distortion or delay."

Since then of course, the frequency range of ferrite isolators has been extended both above and below the microwave range. A variant (multiport circulators) provide the ability to direct the energy. Size, weight and cost remain the major limitations for use of ferrite isolators and circulators. The defining characteristic of an isolator is the asymmetric insertion loss, or stated another way the insertion loss of the isolator depends on the direction of energy flow through the isolator.

2. *"...in which insertion loss of said electronic isolator is dependent upon the direction of signal and noise transmission through said electronic isolator, wherein said insertion loss in one direction is greater than in the other direction"*

Takahashi discloses attenuator circuits wherein the insertion loss is the same (for each specific attenuation mode) whether the input and output are 1 and 2 respectively or interchanged to 2 and 1 respectively. A simple cursory examination of Figure 1 shows a symmetric circuit (as viewed between terminals 1 and ground and 2 and ground), which by definition cannot produce the *asymmetric insertion loss* of an isolator, which is made now part of the limitation in claim 1. Nowhere does Takahashi mention asymmetric loss as a characteristic of its attenuator.

3. *"...configuring means for configuring said path to appear as infinite impedance to the output signal from said source stage..."*

The Examiner stated that Takahashi teaches making shunt circuit may have infinite impedance in thru-mode (col. 4, line 11-12). In reply Applicant points out that:

1) In attenuation mode the T-path does not appear as infinite impedance by Takahashi's own statement that the impedance increases with the frequency of the input signal (col 4, line 16). By definition, increasing impedance cannot be infinite.

2) In the low attenuation mode (thru-mode), Takahashi claims infinite impedance but his circuit implementations cannot produce this. It is well known that an ideal, quarter-wave transmission line will transform a short circuit (zero impedance) into an open circuit (infinite impedance) at the specific frequency where its quarter wavelength matches that of the transmission line. In the "low" attenuation mode, transmission line 12 is not short circuited to ground but rather has impedance to ground comprised of resistor 7 in parallel with the drain-source "on" resistance of FET 11. This can be made low but is greater than zero and so will transform into less than infinite impedance.

Even more significant is the fact that transmission line 12 is not ideal, a condition necessary to produce infinite impedance. In fact, any physically implemented transmission line will have a quality factor Q that compares its performance with an ideal line. Associated with Q is that the bandwidth narrows with increasing Q.

It should be noted that the Takahashi transmission line is in reality a form of microwave resonator since it stores energy. Any change in input signal amplitude, frequency or phase will cause readjustment of the stored energy. The number of cycles necessary to complete this is proportional to the Q (Q=10 requires 10 cycles and a Q of 1000 requires 1000 cycles).

During the appropriate number of cycles, the voltage is changing and the transmission line is sinking or sourcing current from the source signal. As a result, during the transition period, the impedance presented to the source stage cannot be infinite. In reality for an ideal

transmission line with infinite Q, it would take an infinite number of cycles just to initially charge the line and then for each perturbation thereafter. Rather, than infinite impedance, Takahashi produces a low attenuation mode, tee leg impedance that is sufficiently high for his purposes.

Therefore, as Takahashi does not teach these elements of claim 1, Applicant requests that 102 rejection of claim 1 be withdrawn.

Claims 2-4 and 69

Since claim 1 is now allowable, claims 2-4 and 69 are also allowable because they are either dependent on claim 1 or dependent on another claim that depends on claim 1.

Furthermore, with regard to claims 2-4 and 69, Takahashi does not teach a configuring means comprising a voltage source. With regard to claims 3 and 4, Takahashi does not disclose a "T-configuration." Further, with regard to claim 4, Takahashi does not disclose a "controllable voltage source."

Claim 13

With respect to the claim 13, Takahashi fails to teach, describe, or suggest the following feature:

1. *"an active electronic isolator"* and

The alleged active electronic isolator disclosed by Takahashi (A1) is an attenuator, not an isolator. The same explanations for this feature appear in the arguments for claim 1 and apply here as well.

2. *"insertion loss of said electronic isolator is dependent upon the direction of signal and noise transmission through said electronic isolator, wherein said insertion loss in one direction is greater than in the other direction "*

As stated before Takahashi is a symmetric circuit and does not have insertion loss that is dependent upon the direction of signal and noise transmission.

Finally, as described in the "Summary of the Invention" section of the present invention, an electronic isolator provides highly asymmetric/non-reciprocal attenuation of the electrical signals passing between source stage and load stage. An electronic isolator is defined as a device that permits a signal to pass in one direction while providing high isolation to energy in the reverse direction. The examiner states that Takahashi discloses an electronic isolator that provides this characteristic, whose insertion loss is inherently "dependent on the direction of signal and noise transmission through the electronic isolator." This is simply not the case.

Claim 14, 16, 21, and 57

Since claim 13 is now allowable, claims 14, 16, 21, and 57 are also allowable because they are either dependent on claim 13 or dependent on another claim that depends on claim 13.

Applicant further notes that rejection of claims 14, 16, 21, and 57 were made without specific references to the elements suggested or disclosed in the prior art reference Takahashi

Furthermore with regard to claim 14, Takahashi fails to disclose the limitation "wherein insertion loss from the electrical input to the electrical output is substantially less than insertion loss from the electrical output to the electrical input," as Takahashi does not teach any asymmetric insertion loss.

With regard to claim 16, Takahashi does not disclose the limitation of "at least one conductor using a ground signal return path."

With regard to claim 21, Takahashi does not disclose the limitation of "controllable source that is a current or voltage controlled voltage source circuit."

With regard to claim 57, Takahashi does not disclose the limitation of "said controllable source is a pulsed voltage source."

Interview Summary

A telephone interview was conducted on March 15, 2004 between Examiner Nugyen and applicant Robert McClanahan and his representative David Chan. Applicant stated that Takahashi does not teach the limitations in the claims in the present invention, specifically with regard to the asymmetric insertion loss characteristic and the infinite impedance limitations.

The Examiner stated that he would withdraw the current 102(e) rejection based on the reference Takahashi, and suggested amendments to claims 1 and 13 that would make the claims allowable based on previously searched prior art. In the interview, Applicant pointed out that the current set of claims has already undergone two searches. Applicant stressed to the Examiner the need to not have to go through another rejection based on new search in the current claim set. The Examiner proposed that Applicant fax in the proposed claim amendments for review.

CONCLUSION

The Examiner has rejected claims 1-4, 13, 14, 16, 21, 57, and 69. Applicant has responded to the 35 U.S.C. 102(b) rejection on these claims and amended claims 1 and 13. Applicant asserts that the present application is in a condition for allowance.

Respectfully submitted,

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